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### **General practitioners' and nurses' experiences of using computerised decision support in screening for diabetic foot disease**

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## Refereed paper

# General practitioners' and nurses' experiences of using computerised decision support in screening for diabetic foot disease: implementing Scottish Clinical Information – Diabetes Care in routine clinical practice

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## ABSTRACT

**Objective** The Scottish Care Information – Diabetes Collaboration (SCI-DC) developed a computer-based information system to create a shared electronic record for use by all involved in the care of patients with diabetes mellitus. The objectives of this study were to understand primary care practitioners' views towards screening for diabetic foot disease and their experience of the SCI-DC system.

**Method** We conducted an exploratory study using qualitative methods. Semi-structured interviews were audiotape-recorded, transcribed and subjected to thematic analysis. Seven practice nurses and six general practitioners (GPs) with special responsibility for diabetes care in NHS Lothian participated.

**Results** Primary care clinicians reported good systems in place to screen for diabetes-related complications and to refer their patients to specialist care. Foot ulceration was rarely observed; other diabetes-

related conditions were seen as a higher priority. Most had heard of the SCI-DC foot assessment tool, but its failure to integrate with other primary care information technology (IT) systems meant it was not used in these general practices.

**Conclusions** Adoption of the SCI-DC foot assessment tool in primary care is not perceived as clinically necessary. Although information recorded by specialist services on SCI-DC is helpful, important structural barriers to its implementation mean the potential benefits associated with its use are unlikely to be realised; greater engagement with primary care priorities for diabetes management is needed to assist its successful implementation and adoption.

**Keywords:** clinical decision rules, decision aid, diabetes, foot ulcer, risk assessment

## What this study adds

The Scottish Care Information – Diabetes Collaboration (SCI-DC) foot risk assessment tool is recommended in the most recent Scottish Intercollegiate Guideline Network (SIGN) diabetes clinical guideline. It is recognised that the most comprehensive diabetes data are likely to be collected in primary care where the majority of diabetes care is delivered.

Most practice administrators in the practices we visited routinely logged into this clinical information system to obtain clinical data for the purpose of completing the Quality and Outcomes Framework (QOF) targets. However, none of the 13 practice staff we interviewed had ever completed the foot assessment tool. Although the information recorded on the clinical information system by specialist services was thought to be helpful, barriers to its implementation included the inability to backfill general practice information technology (IT) systems such as GPASS, EMIS or VISION.

It has been reported that 40% of people with diabetes have the SCI-DC foot assessment tool populated with patient data, but our research suggests that it is specialists who are likely to be completing these structured data collection templates.

The foot screening tool was perceived to have poor relevance to clinical practice. Future development of this system requires greater engagement with primary care clinicians across Scotland to achieve the desired ends of integrating effectively with general practice IT systems and thereby assist in its successful adoption into routine clinical practice.

## Introduction

The Scottish Care Information – Diabetes Collaboration (SCI-DC) is a computer-based information system designed to create a shared electronic record for use by all involved in the care of patients with diabetes mellitus (Box 1). Information technology (IT) clinical decision support systems like the SCI-DC foot screening tool are complex interventions and their integration into routine practice affects interactions between patients and practitioners, practitioners within a team and practitioners across teams and

organisational structures.<sup>1,2</sup> During development, the SCI-DC foot screening decision support tool was evaluated by primary care nurses and physicians in the region of Scotland (Tayside) in which it was developed. The tool was felt to be informative and easy to use and the drop-down screens supported the clinical management of diabetes related foot ulcers.<sup>3</sup> However, barriers were also identified; these included practitioners' views towards diabetes and computer-based resources, and the time pressure to complete another computer-based system in addition to those already in use.<sup>3</sup> The SCI-DC foot screening decision support tool was modified in order to address these

### Box 1 Background to the development of Scottish Clinical Information – Diabetes Care

Scottish Clinical Information Diabetes Care (SCI-DC) has evolved from a district diabetes register – the Diabetes Audit and Research in Tayside Scotland (DARTS) project. This joint initiative between the Department of Medicine and the Medicines Monitoring unit (MEMO) at the University of Dundee aimed to create a method of record linkage to ascertain cases of diabetes.<sup>1</sup>

SCI-DC is now the national diabetes IT programme providing a single patient record for patients with diabetes in Scotland. It is designed to improve communication between primary and secondary care and to contribute to an improvement in diabetes patient outcomes by integrating the care patients receive as they move between general and specialist services.

SCI-DC is a repository for routinely collected data about all aspects of diabetes care: blood chemistry tests; the patient's general medical history; prescribed medication and the results of any cardiovascular, eye and foot screening, as well as patient education resources.

The SCI-DC foot assessment tool provides a means of treating, educating and stratifying the diabetic population to different levels of care based on an automatic risk categorisation function. The system is designed to be completed by GPs, practice nurses, community podiatrists, treatment room nurses, diabetes specialist nurses and consultants.

issues before a process of Scotland-wide implementation began.<sup>4</sup>

A key question for the development and implementation of complex interventions is whether they have been adopted in usual care.<sup>2</sup> Recent audits suggest the adoption of the SCI-DC foot screening tool in primary care is low: recent estimates suggest that only 40% of people with diabetes in Scotland have a foot risk score recorded in the SCI-DC foot screen.<sup>5</sup> To understand the barriers and facilitators to using the SCI-DC foot screening decision support tool and the likely impact on patient care, it is necessary to explore the perspectives of nurses and general practitioners (GPs) involved in managing patients with diabetes in usual care contexts. Further adaptations might be required in order to integrate the new system into existing healthcare systems, otherwise any potential benefits for the delivery of care could be lost.<sup>6,7,8</sup> The aim of this study was to understand the views, experiences and behaviours of primary care practitioners towards screening for diabetic foot disease and their perceptions of the SCI-DC foot assessment tool.

## Methods

Ethics committee and research and development approvals for this study were granted by the NHS Lothian Research Ethics Committee in 2007 (reference number 08/S1101/10).

## Design

We conducted an exploratory study using qualitative methods; semi-structured interviews were employed to elicit primary care nurses' and GPs' views and experiences about the management of diabetic foot disease and the potential value of SCI-DC. Thematic analysis was used to categorise and interpret findings.<sup>9–11</sup>

## Sampling

NHS Lothian has approximately 814 GPs in 135 practices and a population of almost 30 000 patients with diabetes. GPs and nurses with a specialist interest in diabetes care were eligible for participation. Within qualitative research there is no axiom to calculate the sample size; interviews are carried out until no new themes emerge from the data, i.e. when saturation is achieved. Practitioners were identified via general practice lists available from Information Services Division (ISD) Scotland.<sup>12</sup>

## Recruitment and procedures

A study information letter, consent form, interview schedule (Box 2) and transcript coding frame were piloted in advance of the study using a sample consisting of four people: a GP, a nurse, a health service researcher and a hospital physician. In the first instance, 25 practices in East Lothian were sent a letter addressed to the practitioner with responsibility for diabetes care. There was no response to this cold-calling method.

For the remaining two regions, FC telephoned the practice managers in 65 practices to identify the practitioner with responsibility for diabetes care. Letters of invitation to participate marked private and confidential were then sent to the named practitioners. Up to three follow-up telephone calls were then made to ask eligible GPs or practice nurses if they would like to participate.

## Data generation

Interviews were conducted at the practitioner's surgery. To help orientate the interview, participants were asked to talk in general about the type of diabetes patients that were managed in primary care and their responsibilities for these patients within the practice. The other topics within the interview schedule were related to their beliefs and experiences of foot ulcers in patients with and without diabetes, views on and use of computer-based systems in primary care and views on and use of decision support systems, specifically SCI-DC. Interviews were audiotape-recorded and transcribed verbatim.

## Data analysis

Thematic content analysis was employed to classify participants' utterances and participant identifiers were removed from the transcription used in the analysis.<sup>10,13</sup> The coding frame was developed by applying the following steps:

- each transcript was read in full before the text was split into meaningful phrases or units
- once the complete text was divided into units, the units were reflected upon to ensure a meaning could be assigned to each phrase
- the meanings were discussed between FC and HLB until consensus was reached
- units with similar meanings were then grouped together and preliminary titles or codes assigned to the groupings.

On development of the final coding frame, its validity was further checked by FC and HLB, AS and MY. Any

## Box 2 Initial interview topic guide

### Diabetes management

We are interested in the views of health professionals managing diabetes patients in community settings. Part of the interest is in the screening tests for patients with diabetes.

How is diabetes care organised in your practice?

Who has what roles, how many are in the team, where do you fit into the team? Do you see yourselves as individuals or part of a larger team? Who has responsibility for the screening?

What screening tests do you perform?

How do you think the screening tests contribute to patients' management of diabetes?

(in your experience what do patients think or understand about these tests – low/moderate risk)

Explore views about electronic computer support

What information managements system do you use? How do you integrate this into practice/care of the patient?

Do you find you use it with the patient there or without the patient?

What are the pros and cons of the system, for the patient experience, for managing their care, for referral?

How do you record information from screening for the complications of diabetes? (GPASS, SCI-DC)

Other people have said they need to have informal conversations with other health professionals involved in the care/they are too time consuming

(If use SCI-DC) What do you think of it?

(If don't use SCI-DC) Why not?

How does SCI-DC affect the care of people with diabetes in this practice?

Is there anything you find irritating/unfriendly or user friendly about SCI-DC?

Just a final few sets of questions about screening for diabetic foot disease

Who has responsibility for carrying out the foot screening?

How is the information communicated to the patient/health professional?

Have you ever seen an ulcerated foot?

Did the patient have diabetes?

Can you think of a patient who you were surprised to find had developed a foot ulcer?

Can you think of a patient who went on to develop a foot ulcer when you thought they were not at risk?

How much do you think the foot screening contributes to the identification of the risk of ulcers over and above your clinical expertise?

disagreements about the coding and conceptualisations were discussed until agreement was reached. The coding frame developed by the authors (FC, HLB) was applied to each transcript. No further invitations were issued once it was clear that saturation of themes had been reached by the current sample.

## Results

Ninety practices were invited to take part. Thirteen practitioners with responsibility for diabetes care agreed to be interviewed: six GPs and seven nurses from 12 different practices. One GP and all nurses were females. No practices were single-handed. Interviews lasted between eight and 20 minutes. One practitioner had been involved in the initial development of the SCI-DC.

In total, seven themes emerged:

- 1 practice organisation
- 2 the relationship with the specialist service
- 3 beliefs about diabetes
- 4 beliefs about foot ulcer screening
- 5 responsibility for diabetes care
- 6 barriers to SCI-DC use
- 7 facilitators to SCI-DC use with a focus on systems that work in primary care.

The results are presented using narrative to integrate the themes. The results are discussed under four headings:

- 1 organisational issues in managing patients with diabetes
- 2 knowledge of tests for diabetes-related foot disease
- 3 beliefs and experiences about diabetic foot ulceration
- 4 beliefs and experiences about SCI-DC.

The quotes we present have been selected to illustrate these themes.

## Organisational issues in managing patients with diabetes

Several themes included data about the organisational influences on how practices managed their diabetes care. In Scotland, all insulin-dependent patients and patients with poor diabetes control are managed by specialist hospital-based teams; patients managing their diabetes with dietary control and tablets tend to be co-managed between primary and secondary care.

‘That’s the same across the whole of Lothian, all type 1s will be managed by hospital care and 99% of types 2s on insulin are managed in hospital as well.’ (GP2)

Automated computer-based systems were used to notify patients of routine screening and monitoring appointments.

‘We have em, fairly robust recall systems so we have a register of everyone with diabetes in the practice so when someone is diagnosed with diabetes they have a code recorded on their notes and in their electronic file that will flag up to us when they are due for some kind of screening. We obviously have administration staff who put that on the computer and do all the recall and send all the letters.’ (GP3)

Although there were variations in the practice leads for diabetes management across practices, there was consistency in staff’s responsibilities. The nurses tended to have responsibility for the monitoring and screening, whilst the GPs employed a more direct management role for the more clinically demanding cases; both delivered information and advice to patients. These structures had been influenced by changes resulting from the GP contract and funding, and dividing care between primary and secondary services.

‘We’ve also developed the nursing services within the practice so that in essence our two practice nurses em, do all the day to day diabetes care for type 2 patients who don’t use insulin ... I will see the more complex cases and get an overview of management and responsibility for setting up audits so we’re to make sure we’re managing populations as well, not just individuals to make sure we’re doing what we’re meant to be doing for populations.’ (GP2)

‘Since the beginning of the GP contract, the majority of the chronic disease management, all the chronic disease management is done by the practice nurses.’ (PN3)

Several items alluded to the difficulties and/or tension in managing patients whose care was part-managed by specialist and/or hospital-based practitioners. These included issues around communication, maintaining

accurate records, ensuring a patient received appropriate treatments at the right time without duplication and the differing priorities of general versus specialist practitioners.

‘We tend just to use our own GPASS (General Practice Admission System for Scotland) more em but we do have to put things in twice, and you know we get a letter from the hospital, somebody’s been seen and you get the information sheet so we then have to put the blood pressure into GPASS.’ (GP3)

## Knowledge of tests for diabetes-related foot disease

There was consistency in these primary care practitioners’ knowledge about, and ways of delivering, the tests being carried out during routine monitoring and screening. There was awareness that feet should be checked along with other screening tests including eyes and feet.

‘So I do try to kind of try to convey that to people however, I don’t think the message gets through very well ‘cause whenever I meet a new diabetic patient and they’ve had all the information and I say so what does diabetes mean to you, what does it mean to your future? What do you think the risks are, and only two times out of ten will somebody say oh well there’s an increased risk of vascular disease, you know people think it’s about whether or not they put sugar in their tea. So I do try to say to people that’s what the big risk is, it’s the complications but it’s all the same thing you know its about blood pressure it’s about blood sugar, it’s about lifestyle, you know try to look at the broader preventative aspects (of) it.’ (GP3)

The screening was usually linked with health promotion advice and/or information about the need for additional vigilance and care of feet for patients with diabetes.

‘We use – what happens is the patient comes the week before to have all their bloods done, full screen of everything, you know, and then they come to the clinic the next week which is half an hour and I go through all their blood results, I go through all their symptoms if they’re having any, I go through their medication, I see their feet, I take their blood pressure, weight, height, discuss lifestyle, smoking, alcohol kind of thing and also diet obviously and exercise.’ (PN4)

The primary healthcare practitioners felt more comfortable with carrying out screening techniques for foot disease.

‘I’m checking the temperature, skin, nails, looking for calluses, pulses I check their sensation ... The 10g monofilament and I have the wee Neuropen, y’ know blunt/sharp. I don’t just test their feet, I test right up to their knees.’ (PN7)

'I've got a Doppler, I've got a monofilament and I've got a vibration tuning fork, so I'm all equipped!' (GP5)

There were different ways specialist podiatry services were used by primary care practices; referral to a specialist service when a patient's neuropathy was first identified, referral as a routine part of care for newly diagnosed patients.

'I just leave a note for her (the podiatrist) and then she calls the patient in. I leave a note in her book; she's got a book at reception.' (PN5)

'Any new diabetic who is diagnosed I refer them to the pod(iatrist) at the first consultation, I refer them to the podiatrist for just a screening and we get the SCI-DC thing back from them to say whether they are low, medium or high risk.' (PN1)

'If they are at risk, generally what we do is we go through the whole thing about, if they can't feel their feet then avoid walking about without shoes on and hot water, and technically what happens is if they do have any degree of neuropathy we usually refer them on to the podiatry department and they usually see them three-monthly then.' (PN3)

## Beliefs and experiences about diabetic foot ulceration

Foot ulceration was seen rarely by these primary care practitioners. When foot ulceration was observed, it was usually in patients with poorly controlled diabetes and/or ones already under the care of a podiatrist.

'I mean I've got a patient in the practice that I know of who is in that situation just now (has a foot ulcer) but he attends ... the foot clinic at diabetic outpatients at (the hospital).' (GP3)

'I did see a guy, a young type I, about 18 months ago, and my first sight of this guy was an ulcer that was about 4 cm across down to bone, kind of thing and it was his first presentation to the treatment room and he just came in like that, and you just kind of go agh ... you know ... someone in their early-mid 30's with a completely knackered foot like that, that's kind of surprising.' (GP2)

'Well I've been looking after diabetics for seven or eight years and I've seen two.' (GP4)

'Well I must admit I haven't seen one for the past few years and the reason for that is because maybe our matters of diagnoses and things are so good that we haven't got a chance to, you know. And we give them chiropodist advice, we give them regular tests.' (GP5)

'I wouldn't see more than one or two in a year and we've got 250 patients with diabetes in the practice.' (GP6)

'I've seen ischaemic toes but that's about it, no I haven't seen an ulcer, not that I can think of.' (PN5)

These practitioners considered it important to carry out screening tests to identify an increased risk of foot ulceration and to follow up on care once risk had been identified, and believed that screening did identify patients at risk of foot pathology.

'Well I guess traditionally when I started off people would use tuning forks, you know, to just check vibration sensation via that but I think we've realised that a monofilament is a better way of testing if the person's foot is at risk or not and that's what would be encouraged to be used along with obviously their pulses to check for circulation and on the basis of that the foot screening tool will decide if they're at low, medium or high risk. If they've ever had an ulcer in the past they'll always be high risk. And it's just a way to help nurses and practitioners who maybe aren't diabetes experts to know whether they're dealing with an at risk foot or not automatically, the thing will tell them.' (GP6)

Although the primary care practitioners perceived screening for foot ulceration to be an important aspect of preventive practice and health promotion, there was a sense that the patients they treated required attention and specialist services for diabetes-related conditions other than foot disease.

'but what we're looking at ... it's not just about their feet, obviously we're looking at blood pressure, blood sugar, they're the things that we're dealing with and we're dealing with them anyway so it doesn't surprise me if someone is elderly and has no pulses and no vibration in their feet if they've also got diabetic eye disease and an HbA1c of ten and you know hypertensive, you know, they're the things that we're concentrating on.' (GP3)

'The patient who had terrible feet had terrible diabetes and it was a time bomb sort of waiting to go off ... I mean compared with checking blood pressure and compared with looking at how they look after their sugars – I mean I can't honestly, I honestly can't think of someone who I had to say look you need to do something for your feet.' (GP4)

## Beliefs and experiences of SCI-DC

There were some favourable views about the SCI-DC system, particularly the screens on foot screening, transfer of information from primary care to secondary care, reduction in variability in the information from podiatrists and as a source of information for audit purposes.

'Well no I enjoy ... I like the screens, I think the screens are excellent, I mean they're well ... you know set out and everything (laughs). I'm quite happy with the fact that our data get infiltrated into it but ...' (PN3)

'I mean just now I use SCI-DC mainly just to have a look in and see things and audit and do that. We don't use it as a data entry tool but that's something that we're trying to work on.' (GP6)

Most of the barriers identified by a previous study appeared to remain, however, such as it being a stand-alone system for secondary care, requiring twice as much effort as existing practices, and a perception that it lacks relevance to primary care practices.

'Well they're (other doctors) not using it at all and the reason for that is once you put the data into there it doesn't get into your primary care system and that's what you're measured on the contract on, so why should I double, have to double data entry something in to SCI-DC and then into my primary care system?' (GP6)

'Well we aren't fully linked with it ... I mean the main bugbear is that we don't get information from podiatrists because it's not always up (online) ... because we are with EMISS we're not getting proper connections with SCI-DC. So to me the system has got merits but it's got a lot of failings. Until it's a proper interactive system don't ask me about it ... I mean I'm fed up that it can't properly integrate.' (GP4)

'(the developer of SCI-DC) keeps talking about eventually how one day it will back-populate down to GPASS and maybe if it did that then we might use it, but at the level of screening that, I think, that we're doing, cause we're not doing non-complex cases, then GPASS is sufficient, I think to address the screening we're doing.' (GP2)

'I never get the time, it's a stand-alone system it doesn't run in tandem with ours so if you want to go and look at it, you have to look at it separately. I never find the time to do that.' (PN3)

'but I don't think anybody in any general practice completes SCI-DC network directly ... I would be enormously surprised if anybody does ... there's one spectacularly good reason and that's if we do it that way we don't get paid.' (GP2)

A new set of problems were identified for maintaining the use of SCI-DC in primary care, such as training new staff, maintaining awareness of the system, ensuring access to a system maintained in secondary care and the adaptations required as practice routines change.

'Since the beginning of the GP contract ... all the chronic disease management is done by the practice nurses. So in the beginning when it started we probably did have more time because we were involved in other things and to a certain extent because of the increase in the diabetic population anyway we just do not have time to do it.' (PN3)

'No I don't use it. I haven't got a password for it so I'm not into it. And probably because I'm not, I've not been here very long as well, but we have got SCI-DC and the admin staff use SCI-DC to put all the information on, but I put everything in on GPASS and I know a lot of it goes through to SCI-DC automatically doesn't it?' (PN6)

'No I've never used it at all ... Basically that is a bit of an IT problem I know but we're having servers updated so if

after the servers been updated they can get me in – because I haven't got a password and I can't get in without a password. If I was given a password and shown how to work my way round the screen I'm sure I'd be alright to do it.' (PN6)

'Do you mean just to look to check up on details or to enter data onto it (SCI-DC)? ... Oh I didn't know you could enter data onto it ... I didn't know I could enter data onto it, I just thought that em it was populated from SPICE (Scottish Programme for Improving Clinical Effectiveness), from whatever we put into SPICE and obviously podiatrists and the eye screening people.' (PN7)

There was also a sense that SCI-DC was not as effective as it could be, a sense that the information provided was not up to date and/or relevant and that it was detrimental to established older systems such as sending letters.

'I think sometimes it doesn't have all the information there even though the person's been seen we've got it written down it doesn't have all the information there.' (GP3)

'The podiatrists are increasing not ... they used to send us a letter with the person's foot check on it but now to save them double data entry and not having to write out a sheet and then put it in the computer they're just putting it in SCI-DC.' (GP6)

It was evident that primary care practices were being approached by a variety of sources to use systems designed to make their services more efficient; SCI-DC was just another system out of several that practices are being asked to utilise.

'SCI (Scottish Clinical Information) is our way of making an electronic referral.' (GP2)

'Well we have a template for diabetes which we complete during the course of the diabetic consultation ... well it's one we've designed ourselves ... we are an EMISS practice.' (GP4)

'CDSS so it's clinical, just another clinical system, it was in response ... I think Merck, Sharp, Dome originally kind of came up with the idea and its kind of been launched out.' (PN3)

## Discussion

### Principal findings

Our research revealed that general practices in NHS Lothian routinely use a variety of computer-based systems and clinical decision support tools to manage the care of patients.<sup>14</sup> All who participated in our study reported well established procedures for monitoring the health of people with diabetes, and annual



health checks were combined with health promotion advice and information about the management of diabetes to support patients' self care. Most had heard of the SCI-DC system, which was perceived as convenient for those delivering care in diabetic specialist services but not especially useful for those delivering general diabetic care. None of the GPs or practice nurses we interviewed had ever completed the SCI-DC foot assessment tool despite diabetic foot risk assessments forming part of the Quality and Outcomes Framework (QOF).<sup>15</sup> A major barrier to the use of the SCI-DC system was the failure of the system to populate any of the IT systems used in primary care.<sup>2</sup> We learned that podiatrists who complete assessments using SCI-DC no longer write letters to inform primary care practitioners about their patients' foot health and it seemed that it was undermining 'old fashioned' modes of communication between services which were in place and had been working effectively. The practitioners we interviewed estimated the incidence of foot ulceration in their diabetic patients to be very low. This level is consistent with the incidence of foot ulceration reported in cohort studies of people with diabetes who are managed in community settings.<sup>16,17</sup>

## Implications of the findings

Improvements in several areas are required to be made if this clinical information system is to be utilised effectively in primary care, including staff training, maintaining staff awareness of the system and improving access to a system maintained in secondary care. The system needs to be flexible enough to adapt in line with changes in routine clinical practice and general practices need communication from specialist services, rather than just more effective data management systems, to ensure that clinical information is acted upon and patient information is not lost between services. Systems updates of patient information need to be as efficient as possible to ensure that the most recent data are available.

## Comparison with the existing literature

The successful adoption of IT into everyday working practices has been explored using diffusion theory, in which the acceptance or rejection of an innovation is considered according to the benefits the adopter expects to accrue from their own independent use of technology.<sup>18</sup> GPs in England have reported podiatrists using a GP IT system template to record the results of foot assessment for people with diabetes in order to streamline the administrative processes associated with the General Medical Services (GMS) contract

and the QOF.<sup>19</sup> An analysis of usage of a previous web-based diabetes clinical information system in Tayside, Scotland found the number of GPs who accessed the system between 2001 and 2003 diminished, while its use by practice nurses increased during the same period.<sup>20</sup> The authors suggested that the adoption of the IT was highly dependent on its uptake by nurses, but it has been demonstrated that nurse-led computerised systems which are not integrated into GP IT systems also fail to be implemented into routine clinical practice.<sup>21</sup>

## Recommendations for further development

The duplication of effort involved in completing the SCI-DC foot screen and then completing the GP IT system through which the practice receives remuneration is unnecessarily time consuming and it is clear that the integration of this diabetes clinical information system into GP IT systems is central to its adoption in primary care. However, the perceived lack of relevance to clinical practice in primary care is a key element which may stifle adoption of the SCI-DC foot assessment tool even after improvements have been made in links with GP IT systems.

## Limitations of the methods

This study obtained the views of a relatively small number of practitioners with responsibility for diabetes care in NHS Lothian. The poor response to our initial invitation by practitioners in East Lothian led to a change in our approach to recruitment and the response rate was improved by personalising invitations and emphasising confidentiality. Evidence from survey methods suggests that these motivational factors can have a positive effect on response rates and they seemed to work in our study.<sup>22</sup> The topic appeared to lack importance for most people we contacted and it is possible that those who did agree to participate are representative of clinical enthusiasts. It has been reported that 40% of people with diabetes have the SCI-DC foot assessment tool populated with patient data; our respondents suggest that it is specialists who are completing this IT system.

## Conclusions

A fundamental barrier to the implementation of the SCI-DC foot assessment tool in primary care is the

perception that it does not fulfil a clinical need in general practice. Although the information recorded by specialist services on SCI-DC is helpful, the inability to backfill GP systems mean its benefits may be lost. Future development of this system requires greater engagement with primary care to achieve its integration with GP IT systems and to assist its adoption into routine clinical practice.<sup>23–25</sup>

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**CONFLICTS OF INTEREST**

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